

Planning Resource for Grade 5/6

Continuum of Mathematics Expectations

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NUMBER SENSE AND NUMERATION

1. Quantity Relationships

Grade 5	Grade 6
Overall Expectation	
- Read, represent, compare, and order whole numbers to 100 000, decimal numbers to hundredths, proper and improper fractions, and mixed numbers	- Read, represent, compare, and order whole numbers to 1 000 000, decimal numbers to thousandths, proper and improper fractions, and mixed numbers
Specific Expectations	
- Represent, compare, and order whole numbers and decimal numbers from 0.01 to 100 000, using a variety of tools	- Represent, compare, and order whole numbers and decimal numbers from 0.001 to 1 000 000, using a variety of tools
- Demonstrate an understanding of place value in whole numbers and decimal numbers from 0.01 to 100 000, using a variety of tools and strategies	- Demonstrate an understanding of place value in whole numbers and decimal numbers from 0.001 to 1 000 000, using a variety of tools and strategies
- Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 100 000	- Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1 000 000
- Read and print in words whole numbers to ten thousand, using meaningful contexts	- Read and print in words whole numbers to one hundred thousand, using meaningful contexts
- Represent, compare, and order fractional amounts with like denominators, including proper and improper fractions and mixed numbers, using a variety of tools	- Represent, compare, and order fractional amounts with unlike denominators, including proper and improper fractions and mixed numbers, using a variety of tools
- Demonstrate and explain the concept of equivalent fractions, using concrete materials	
- Round decimal numbers to the nearest tenth, in problems arising from real-life situations	
- Demonstrate and explain equivalent representations of a decimal number, using concrete materials and drawings	
- Read and write money amounts to \$1000	
	- Estimate quantities using benchmarks of 10%, 25%, 50%, 75%, and 100%
	- Identify composite numbers and prime numbers, and explain the relationship between them (i.e., any composite number can be factored into prime factors)

2. Counting

Grade 5		Grade 6	
Overall Expectation			
- Demonstrate an understanding of magnitude by counting forward and backwards by 0.01			
Specific Expectations			
- Count forward by hundredths from any decimal number expressed to two decimal places, using concrete materials and number lines			

3. Operational Sense

Grade 5	Grade 6
Overall Expectation	
- Solve problems involving the multiplication and division of multi-digit whole numbers, and involving the addition and subtraction of decimal numbers to hundredths, using a variety of strategies	- Solve problems involving the multiplication and division of whole numbers, and the addition and subtraction of decimal numbers to thousandths, using a variety of strategies
Specific Expectations	
- Solve problems involving the addition, subtraction, and multiplication of whole numbers, using a variety of mental strategies	- Use a variety of mental strategies to solve addition, subtraction, multiplication, and division problems involving whole numbers
	- Solve problems involving the multiplication and division of whole numbers (four digit by two-digit), using a variety of tools and strategies
- Multiply two-digit whole numbers by two-digit whole numbers, using estimation, student-generated algorithms, and standard algorithms	- Multiply whole numbers by 0.1, 0.01, and 0.001 using mental strategies
- Divide three-digit whole numbers by one-digit whole numbers, using concrete materials, estimation, student-generated algorithms, and standard algorithms	
- Use estimation when solving problems involving the addition, subtraction, multiplication, and division of whole numbers, to help judge the reasonableness of a solution	- Use estimation when solving problems involving the addition and subtraction of whole numbers and decimals, to help judge the reasonableness of a solution
- Add and subtract decimal numbers to hundredths, including money amounts, using concrete materials, estimation, and algorithms	- Add and subtract decimal numbers to thousandths, using concrete materials, estimation, algorithms, and calculators
- Multiply decimal numbers by 10, 100, 1000, and 10 000, and divide decimal numbers by 10 and 100, using mental strategies	- Multiply and divide decimal numbers by 10, 100, 1000, and 10 000 using mental strategies
	- Multiply and divide decimal numbers to tenths by whole numbers, using concrete materials, estimation, algorithms, and calculators
	- Explain the need for a standard order for performing operations, by investigating the impact that changing the order has when performing a series of operations

4. Proportional Relationships

Grade 5		Grade 6	
Overall Expectation			
- Demonstrate an understanding of proportional reasoning by investigating whole-number rates		- Demonstrate an understanding of relationships involving percent, ratio, and unit rate	
Specific Expectations			
- Describe multiplicative relationships between quantities by using simple fractions and decimals			
- Determine and explain, through investigation using concrete materials, drawings, and calculators, the relationship between fractions (i.e., with denominators of 2, 4, 5, 10, 20, 25, 50, and 100) and their equivalent decimal forms		- Determine and explain, through investigation using concrete materials, drawings, and calculators, the relationships among fractions (i.e., with denominators of 2, 4, 5, 10, 20, 25, 50, and 100), decimal numbers, and percents	
- Demonstrate an understanding of simple multiplicative relationships involving whole-number rates, through investigation using concrete materials and drawings		- Represent relationships using unit rates	
		- Represent ratios found in real-life contexts, using concrete materials, drawings, and standard fractional notation	

MEASUREMENT

1. Attributes, Units, and Measurement Sense

Grade 5		Grade 6	
Overall Expectation			
- Estimate, measure, and record perimeter, area, temperature change, and elapsed time, using a variety of strategies		- Estimate, measure, and record quantities, using the metric measurement system	
Specific Expectations			
- Estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools			
- Estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest second			
- Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in minutes, hours, days, weeks, months, or years			
- Measure and record temperatures to determine and represent temperature changes over time			
		- Estimate, measure, and record length, area, mass, capacity, and volume, using the metric measurement system	
		- Demonstrate an understanding of the relationship between estimated and precise measurements, and determine and justify when each kind is appropriate	

2. Measurement Relationships

Grade 5	Grade 6
Overall Expectation	
- Determine the relationships among units and measurable attributes, including the area of a rectangle and the volume of a rectangular prism	- Determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism
Specific Expectations	
- Select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure length, height, width, and distance, and to measure the perimeter of various polygons	- Select and justify the appropriate metric unit (i.e., millimetre, centimetre, decimetre, metre, decametre, kilometre) to measure length or distance in a given real-life situation
- Select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram, tonne)	
- Determine, through investigation, the relationship between capacity (i.e., the amount a container can hold) and volume (i.e., the amount of space taken up by an object), by comparing the volume of an object with the amount of liquid it can contain or displace	
- Solve problems requiring conversion from metres to centimetres and from kilometres to metres	- Solve problems requiring conversion from larger to smaller metric units
	- Determine, using concrete materials, the relationship between units used to measure area (i.e., square centimetre, square metre), and apply the relationship to solve problems that involve conversions from square metres to square centimetres
- Solve problems involving the relationship between a 12-hour clock and a 24-hour clock	
- Determine, through investigation using a variety of tools and strategies, the relationships between the length and width of a rectangle and its area and perimeter, and generalize to develop the formulas [i.e., $Area = length \times width$; $Perimeter = (2 \times length) + (2 \times width)$]	- Determine, through investigation using a variety of tools and strategies, the relationship between the area of a rectangle and the areas of parallelograms and triangles, by decomposing and composing
	- Develop the formulas for the area of a parallelogram (i.e., $Area\ of\ parallelogram = base \times height$) and the area of a triangle [i.e., $Area\ of\ triangle = (base \times height) \div 2$], using the area relationships among rectangles, parallelograms, and triangles
- Solve problems requiring the estimation and calculation of perimeters and areas of rectangles	- Solve problems involving the estimation and calculation of the areas of triangles and the areas of parallelograms
- Create, through investigation using a variety of tools and strategies, two-dimensional shapes with the same perimeter or the same area	- Construct a rectangle, a square, a triangle, and a parallelogram, using a variety of tools given the area and/or perimeter

- Determine, through investigation using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism, and generalize to develop the formula (i.e., <i>Volume = area of base x height</i>)	- Determine, through investigation using a variety of tools and strategies the relationship between the height, the area of the base, and the volume of a triangular prism, and generalize to develop the formula (i.e., <i>Volume = area of base x height</i>)
	- Determine, through investigation using a variety of tools and strategies, the surface area of rectangular and triangular prisms
	- Solve problems involving the estimation and calculation of the surface area and volume of triangular and rectangular prisms

GEOMETRY AND SPATIAL SENSE

1. Geometric Properties

Grade 5		Grade 6	
Overall Expectation			
- Identify and classify two-dimensional shapes by side and angle properties, and compare and sort three-dimensional figures		- Classify and construct polygons and angles	
Specific Expectations			
		- Sort and classify quadrilaterals by geometric properties related to symmetry, angles, and sides, through investigation using a variety of tools and strategies	
- Distinguish among polygons, regular polygons, and other two-dimensional shapes		- Sort polygons according to the number of lines of symmetry and the order of rotational symmetry, through investigation using a variety of tools	
- Distinguish among prisms, right prisms, pyramids, and other three-dimensional figures			
- Identify and classify acute, right, obtuse, and straight angles			
– Measure and construct angles up to 90°, using a protractor		- Measure and construct angles up to 180° using a protractor, and classify them as acute, right, obtuse, or straight angles	
– Identify triangles (i.e., acute, right, obtuse, scalene, isosceles, equilateral), and classify them according to angle and side properties			
– Construct triangles, using a variety of tools, given acute or right angles and side measurements		– Construct polygons using a variety of tools, given angle and side measurements	

2. Geometric Relationships

Grade 5		Grade 6	
Overall Expectation			
- Identify and construct nets of prisms and pyramids		- Sketch three-dimensional figures, and construct three-dimensional figures from drawings	
Specific Expectations			
		- Sketch, using a variety of tools, isometric perspectives and different views (i.e., top, side, front) of three dimensional figures built with interlocking cubes	
- Identify prisms and pyramids from their nets		- Build three-dimensional models using connecting cubes, given isometric sketches or different views (i.e., top, side, front) of the structure	
– Construct nets of prisms and pyramids, using a variety of tools			

3. Location and Movement

Grade 5		Grade 6	
Overall Expectation			
- Identify and describe the location of an object, using the cardinal directions, and translate two-dimensional shapes		- Describe location in the first quadrant of a coordinate system, and rotate two- dimensional shapes	
Specific Expectations			
- Locate an object using the cardinal directions (i.e., north, south, east,west) and a coordinate system		- Explain how a coordinate system represents location, and plot points in the first quadrant of a Cartesian coordinate plane	
– Compare grid systems commonly used on maps (i.e., the use of numbers and letters to identify an area; the use of a coordinate system based on the cardinal directions to describe a specific location)			
– Identify, perform, and describe translations, using a variety of tools		– Identify, perform, and describe, through investigation using a variety of tools, rotations of 180° and clockwise and counterclockwise rotations of 90°, with the centre of rotation inside or outside the shape	
– Create and analyse designs by translating and/or reflecting a shape, or shapes, using a variety of tools		– Create and analyse designs made by reflecting, translating, and/or rotating a shape, or shapes, by 90° or 180°	

PATTERNING & ALGEBRA

1. Patterns and Relationships

Grade 5		Grade 6	
Overall Expectation			
- determine, through investigation using a table of values, relationships in growing and shrinking patterns, and investigate repeating patterns involving translations		- describe and represent relationships in growing and shrinking patterns (where the terms are whole numbers), and investigate repeating patterns involving rotations	
Specific Expectations			
– make a table of values for a pattern that is generated by adding or subtracting a number to get the next term, or by multiplying or dividing by a constant to get the next term, given either the sequence or the pattern rule in words		– make tables of values for growing patterns, given pattern rules in words then list the ordered pairs and plot the points in the first quadrant, using a variety of tools	
- create, identify, and extend numeric and geometric patterns, using a variety of tools		– identify geometric patterns, through investigation using concrete materials or drawings, and represent them numerically	
- build a model to represent a number pattern presented in a table of values that shows the term number and the term		- determine a term, given its term number, by extending growing and shrinking patterns that are generated by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term	
		– determine the term number of a given term in a growing pattern that is represented by a pattern rule in words, a table of values, or a graph	
– make predictions related to growing and shrinking geometric and numeric patterns		- describe pattern rules (in words) that generate patterns by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term then distinguish such pattern rules from pattern rules, given in words, that describe the general term by referring to the term number	
– extend and create repeating patterns that result from translations, through investigation using a variety of tools		– extend and create repeating patterns that result from rotations, through investigation using a variety of tools	

2. Expressions and Equality

Grade 5		Grade 6	
Overall Expectation			
- demonstrate, through investigation, an understanding of the use of variables in equations		- use variables in simple algebraic expressions and equations to describe relationships	
Specific Expectations			
– determine the missing number in equations involving addition, subtraction, multiplication, or division and one- or two digit numbers, using a variety of tools and strategies			
		– demonstrate an understanding of different ways in which variables are used	
– demonstrate, through investigation, an understanding of variables as changing quantities, given equations with letters or other symbols that describe relationships involving simple rates		– identify, through investigation, the quantities in an equation that vary and those that remain constant	
– demonstrate, through investigation, an understanding of variables as unknown quantities represented by a letter or other symbol		– solve problems that use two or three symbols or letters as variables to represent different unknown quantities	
		– determine the solution to a simple equation with one variable, through investigation using a variety of tools and strategies	

DATA MANAGEMENT & PROBABILITY

1. Collection and Organization of Data

Grade 5	Grade 6
Overall Expectation	
- collect and organize discrete or continuous primary data and secondary data and display the data using charts and graphs, including broken-line graphs	- collect and organize discrete or continuous primary data and secondary data and display the data using charts and graphs, including continuous line graphs
Specific Expectations	
– distinguish between discrete data (i.e., data organized using numbers that have gaps between them, such as whole numbers, and often used to represent a count, such as the number of times a word is used) and continuous data (i.e., data organized using all numbers on a number line that fall within the range of the data, and used to represent measurements such as heights or ages of trees)	
- collect data by conducting a survey or an experiment do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements	- collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements
- collect and organize discrete or continuous primary data and secondary data and display the data in charts, tables, and graphs (including broken-line graphs) that have appropriate titles, labels and scales that suit the range and distribution of the data using a variety of tools	- collect and organize discrete or continuous primary data and secondary data and display the data in charts, tables, and graphs (including continuous line graphs) that have appropriate titles, labels, and scales that suit the range and distribution of the data, using a variety of tools
- demonstrate an understanding that sets of data can be samples of larger populations	- determine, through investigation, how well a set of data represents a population, on the basis of the method that was used to collect the data
- describe, through investigation, how a set of data is collected and explain whether the collection method is appropriate	
	– select an appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph (i.e., from types of graphs already studied, such as pictographs, horizontal or vertical bar graphs, stem-and-leaf plots, double bar graphs, broken-line graphs, and continuous line graphs)

2. Data Relationships

Grade 5	Grade 6
Overall Expectation	
- read, describe, and interpret primary data and secondary data presented in charts and graphs, including broken-line graphs	- read, describe, and interpret data, and explain relationships between sets of data
Specific Expectations	
- read, interpret, and draw conclusions from primary data and from secondary data	- read, interpret, and draw conclusions from primary data and from secondary data, presented in charts, tables, and graphs (including continuous line graphs)
- calculate the mean for a small set of data and use it to describe the shape of the data set across its range of values, using charts, tables, and graphs	- demonstrate an understanding of mean, and use the mean to compare two sets of related data, with and without the use of technology
- compare similarities and differences between two related sets of data, using a variety of strategies	
	- compare, through investigation, different graphical representations of the same data
	- demonstrate, through investigation, an understanding of how data from charts, tables, and graphs can be used to make inferences and convincing arguments
	- explain how different scales used on graphs can influence conclusions drawn from the data

3. Probability

Grade 5	Grade 6
Overall Expectation	
- represent as a fraction the probability that a specific outcome will occur in a simple probability experiment, using systematic lists and area models	- determine the theoretical probability of an outcome in a probability experiment, and use it to predict the frequency of the outcome
Specific Expectations	
- determine and represent all the possible outcomes in a simple probability experiment, using systematic lists and area models	
	- express theoretical probability as a ratio of the number of favourable outcomes to the total number of possible outcomes, where all outcomes are equally likely
- pose and solve simple probability problems, and solve them by conducting probability experiments and selecting appropriate methods of recording the results	- predict the frequency of an outcome of a simple probability experiment or game, by calculating and using the theoretical probability of that outcome
- represent, using a common fraction, the probability that an event will occur in simple games and probability experiments	- represent the probability of an event (i.e., the likelihood that the event will occur), using a value from the range of 0 (never happens or impossible) to 1 (always happens or certain)